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AUTHOR	O'Neill, John J.
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ABSTRACT

The basic premise of this report is that cable television systems, although currently based on subscriber fees, will eventually obtain their capital structure from advertising revenues. Because of this, the report maintains that market saturation must be the prime consideration, even though several currently common practices go against this and should be guarded against: short-run profit-maximization calls for higher subscriber rates and only partial market penetration. With issues such as these at stake, it is argued that the introduction of cable systems into the nation's urban centers presents almost equal measures of promise and peril to potential builders of such systems. (RH)

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CATV'S CRITICAL MASS PROBLEM

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CATV'S

CRITICAL MASS PROBLEM

PRESENTED TO

NATIONAL CABLE TELEVISION ASSOCIATION

1972 CONVENTION

JOHN J. O'NEILL

MAY 1972

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ABSTRACT

System penetration, subscriber growth rate and subscriber fees are basic cable system parameters. In order to obtain the critical mass of subscribers necessary for both the economic and social viability of urban cable systems, some changes in the method of determining these parameters may be necessary. Some of these changes and the ideas behind them are presented, not as solutions but as alternatives.

TABLE OF CONTENTS

	Page
LIST OF FIGURES	vi
LIST OF TABLES	vi
PROMISES AND PERILS	1
PLANNING CRITERION	2
PENETRATION	2
REQUESTING RATE INCREASES	7
AGGREGATED CLIENTELE	9
COMMUNITY PARTICIPATION	12
SUMMARY	13
ACKNOWLEDGEMENT	13
REFERENCES	15

LIST OF FIGURES

Figure Number		Page
1	Relationship of Expected Final Penetration to Monthly Subscriber Fee for Two Combinations of Services	4
2	Penetration Versus Annual Dollars Per Household for One-Way System	5
3	Penetration Vs Annual Dollars Per Household for Two-Way System	6
4	Comparison of Internal Rate of Return on Equity	8

LIST OF TABLES

Table Number		Page
I	Point-to-Point Nets	10
II	Sensitivity Analyses	14

PROMISES AND PERILS

The introduction of cable systems into the nation's urban centers presents almost equal measures of promise and peril to potential builders of such systems. The opportunities and needs of urban centers present a direct and welcomed challenge to cable system advocates almost everywhere. Communications, in general, and cable, in particular, have long been heralded as the means toward such broad and laudable goals as better understanding among citizens and improved urban living. The magic of words like "interactive" and "two-way" simply quickens the excitement; almost by their very mention alone.

However, businessmen and bankers quickly note fundamentals.

(1) Urban dwellers already have an abundance of clear TV pictures. In addition, they may have a significant number of attractive cultural and entertainment alternatives readily available.

(2) No one has identified an aggregated set of services that will insure adequate system penetration.

(3) A basic cable distribution plant must be laid in each major urban center and this represents a major initial capital expenditure. The need for set-top converters in virtually every urban household does nothing but increase this expenditure.

The degree of peril is clearly indicated by the interest rates currently charged for borrowed capital.[1]

1

Financially the cable industry has evolved much as the telephone industry; that is, subscriber fees have formed the financial structure. If one assumes the cable industry is more like the broadcasting industry - that is, advertising revenues instead of subscriber fees will eventually support the capital structure - it is clear that almost total penetration will become mandatory. What advertiser wants to talk to less than 50% of an urban market when he can reach an entire region via radio or TV broadcasting or newspapers?

In either case the key to cable may be simply stated by one word - SUBSCRIBERS and the goal line is clearly marked - SATURATION.

PLANNING CRITERION

Starting with the positive premise that cable will eventually be as ubiquitous as the telephone and the electric, gas and water utilities, and that the benefits of total penetration are desirable, one criterion might be applied to all system planning decisions; viz, "MAKE THE DECISION THAT WILL ACCELERATE THE SUBSCRIBER GROWTH RATE WHILE STILL GUARANTEEING ECONOMIC VIABILITY".

This "motherhood" criterion may appear to be obvious; its application may not be. The following are examples of this criterion applied to a few of the basic system parameters of urban cable systems.

PENETRATION

In rural areas where over-the-air TV reception is poor and nearby cultural and entertainment opportunities are nil, it has been said that monthly subscriber fees anywhere in the range of $3 to $8

will result in about the same number of subscribers. Over the last few months articles, apparently based on this premise, have been advising operators not to be timid about requesting rate increases. This advice may not apply in urban areas where people have many alternatives to cable--such as a pair of rabbit ears.

One particular urban survey was specifically designed to determine the incremental demand for different types of services and programming as a function of the subscriber fees charged. It was conducted by Howard University in Washington, D.C. for The MITRE Corporation. The results were applied to a cable system design for Washington, D.C.[2] Figure 1 shows the main results of the Howard survey; namely, the final penetration is very much a function of the monthly subscriber fee charged. As the fee is lowered, more subscribers come on board; regardless of the sophistication of the services being provided.

Time could be spent arguing the absolute value of the final penetration, the most desirable service or group of services, or the slope of the curves. But one thing is clear, the curves have slopes. The only place the curves level off is when subscriber fees are so high that no one subscribes and zero penetration is obtained.

Figures 2 and 3 display this data in terms of total system revenue for various combinations of subscriber fees and penetration. The cost of building and operating the system is overlaid on the revenue data. It can be seen that the profits, or the difference

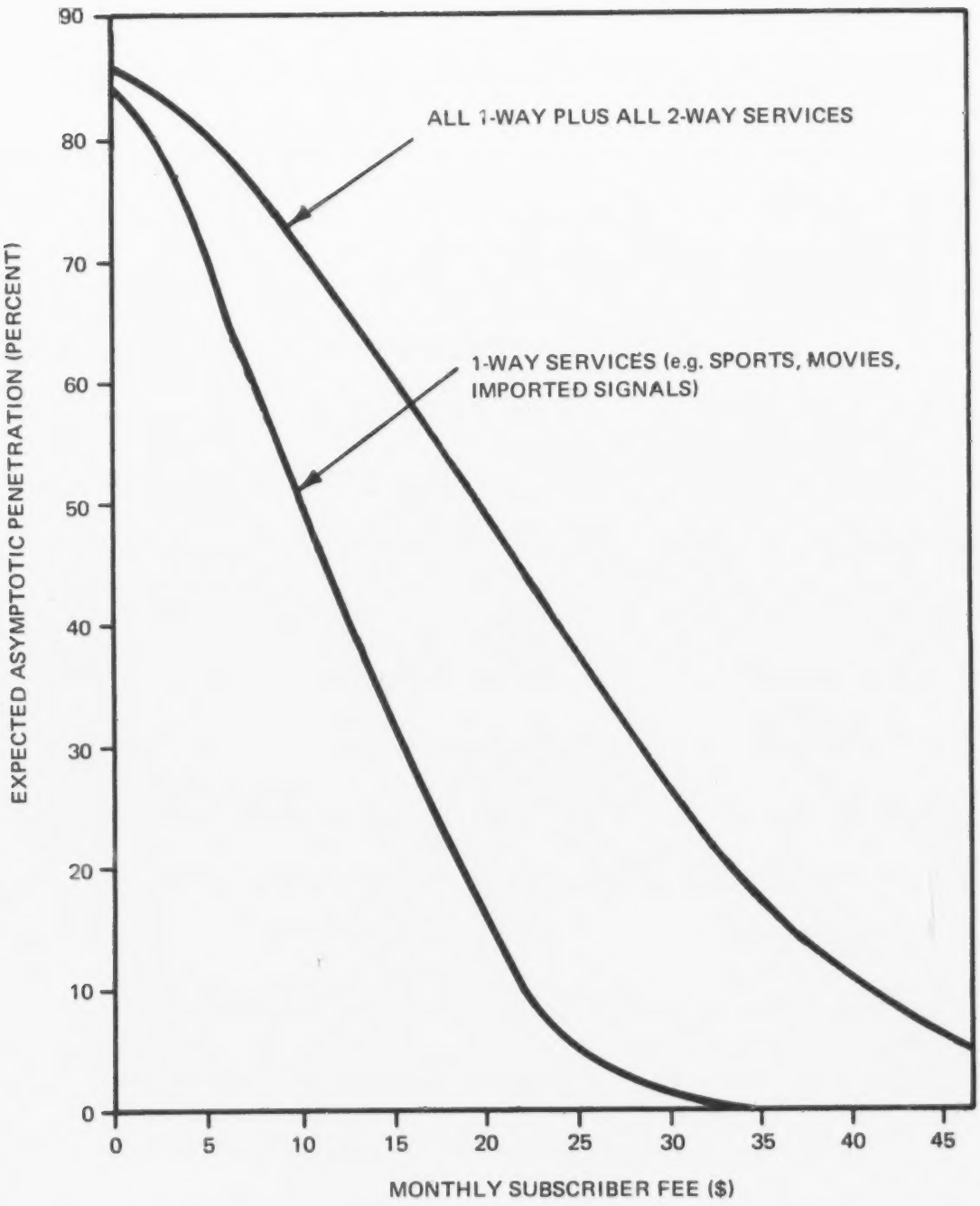

FIGURE I

RELATIONSHIP OF EXPECTED FINAL PENETRATION TO MONTHLY SUBSCRIBER FEE FOR TWO COMBINATIONS OF SERVICES

4

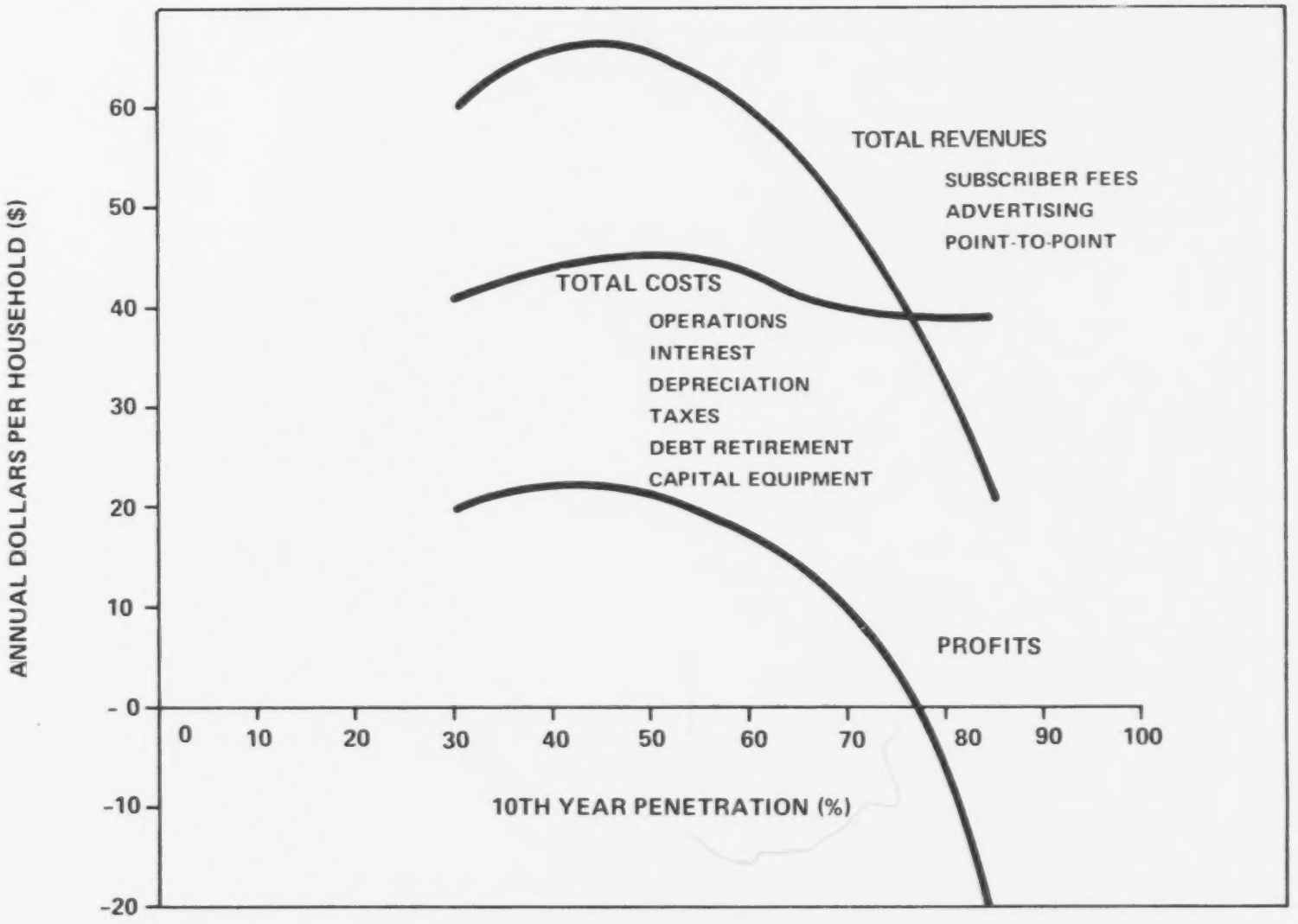

FIGURE 2

PENETRATION VERSUS ANNUAL DOLLARS PER HOUSEHOLD
FOR ONE-WAY SYSTEM

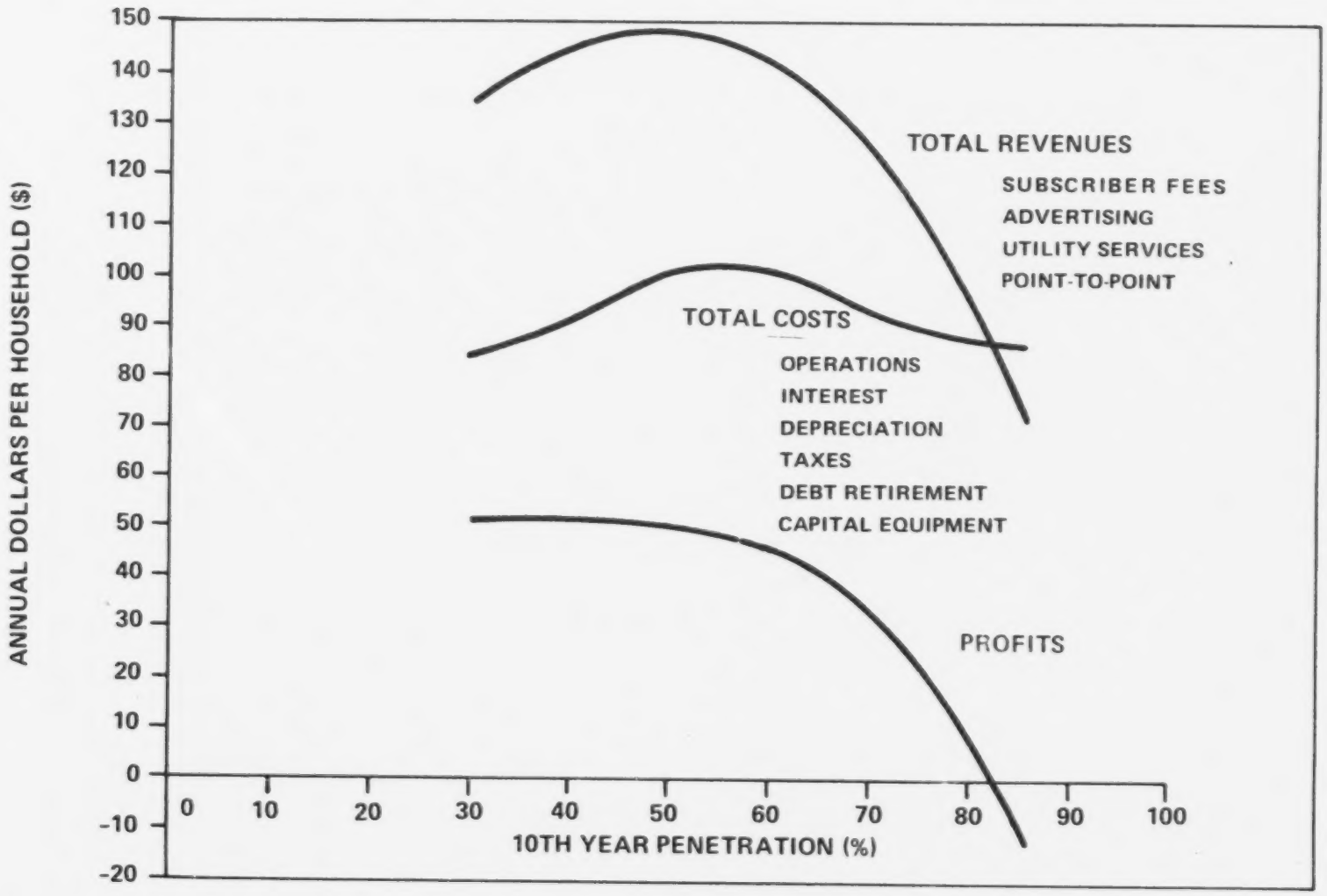

FIGURE 3
PENETRATION VS ANNUAL DOLLARS PER HOUSEHOLD
FOR TWO-WAY SYSTEM

between revenues and cost, peak in the region of 50% penetration and at a monthly subscriber fee of approximately $8.

Now comes the dilemma and the decision!

Which is more important to management, higher surpluses or higher penetrations? Or more basically, will a monthly fee of $3.50 be charged in an attempt to obtain a penetration of 70% or more - or $8.00 in an attempt to maximize near term profits?

The main criterion opts for maximizing system penetration.

REQUESTING RATE INCREASES

During the early years of system implementation there is another tempting mechanism available to cable system operators to increase revenues. Figure 4 shows rate-of-return on equity in each year of system operation, assuming a 2:1 debt-to-equity ratio. This annual rate-of-return assumes the final value of the system to be seven times the annual revenue, plus cash-on-hand, minus outstanding debt. The peak in the rate-of-return is partly caused by tax carry-over provisions. The early years of no positive rate-of-return illustrates that cable needs plenty of capital while it is being built with little hope of financial return.

The temptation to seek rate increases from city councils in these early years, while losses can be documented, should be resisted. Again, because such a rate increase would only slow both the subscriber growth rate and the final penetration.

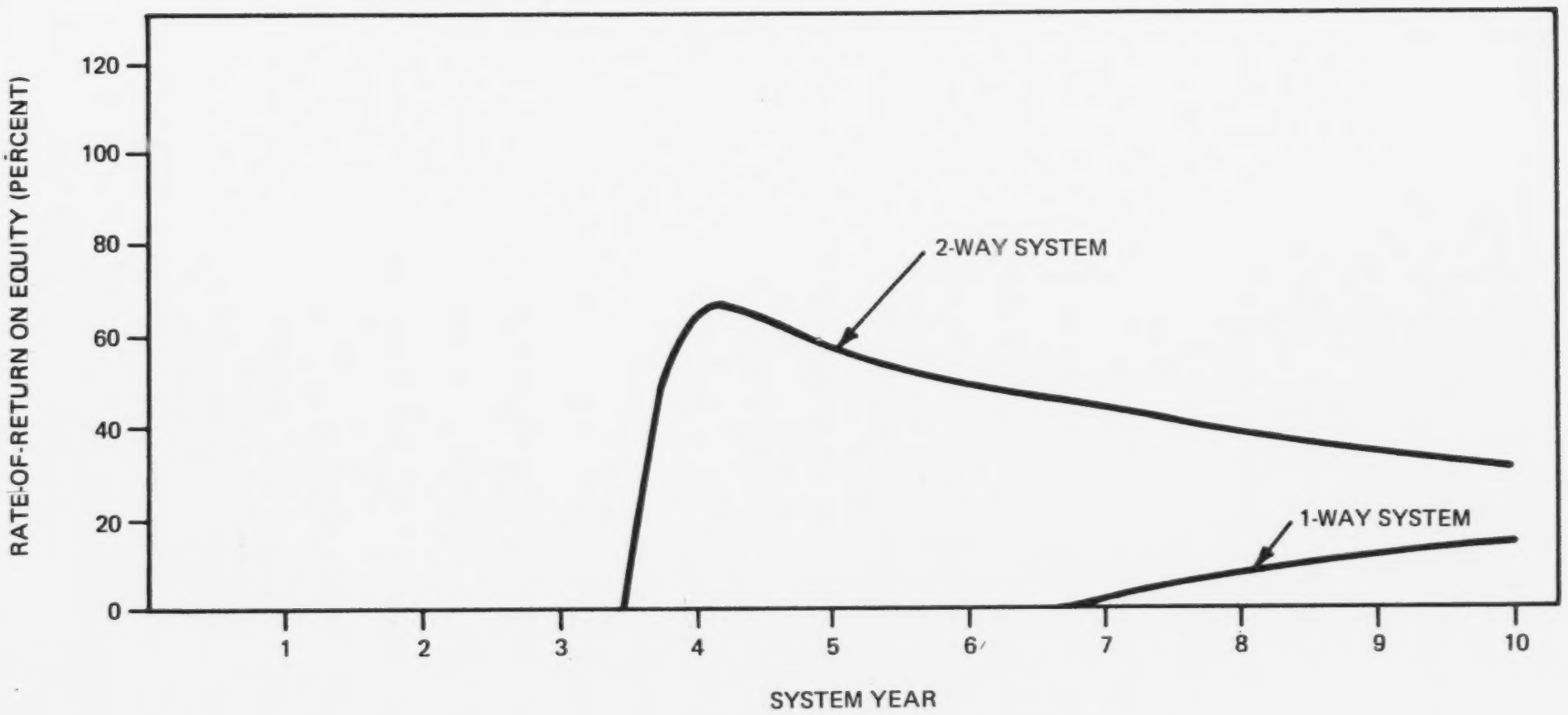

FIGURE 4

COMPARISON OF INTERNAL RATE OF RETURN ON EQUITY

AGGREGATED CLIENTELE

When cable enters the nation's urban centers it should direct its capability for services toward all the residents of the city - to the municipal government, to the public and private schools, to the colleges and universities and to the business and commerce community, as well as to the "household communities".

The FCC Rules and Regulations[3] include a requirement for a municipal channel, and an education channel. Why not a cable-full-of-channels for each? Why not separate point-to-point cable nets overlaid in a grid-like fashion on the conventional cable distribution plant; one each for the municipal government, the educational institutions and major business concerns? Table I shows key characteristics of such nets for Washington, D.C. and the costs are included as part of the total system costs plotted in Figures 2 and 3.

Selective Power Control is being used by Detroit Edison to help alleviate brownout and blackout problems. There, 200,000 dual element water heaters, representing 360 MW of power, are radio controlled. During short peak load periods one element of these heaters is selectively turned off. Thus, up to 360 MW of power, costing $77M of standby plant equipment, does not have to be generated. The radio control system costs $9.6M. Part of the savings are passed on as lower yearly utility rates (and subscriber fees?). Cable systems could easily provide the communication link for this type of service. Iron lungs, elevators and hospitals could be given a higher assurance

TABLE I
POINT-TO-POINT NETS

TYPE	NUMBER OF SUBS.	LENGTH (MILES)
FEDERAL CAPITOL BUILDING AND MAJOR FEDERAL BUILDINGS $417,000 30 CHANNEL PAIRS	54	10
MUNICIPAL SCHOOLS, FIRE, POLICE, HOSPITALS, SANITATION, ETC. $807,000 14 CHANNEL PAIRS	271	73
INSTITUTIONAL BANKS, DEPARTMENT STORES $952,000 14 CHANNEL PAIRS	300 to 3000	50
HIGHER EDUCATION ALL PUBLIC AND PRIVATE FACILITIES $183,000 14 CHANNEL PAIRS	23	15

of continuous operation at the expense of air conditioners, washing machines and dryers.

Why not promote Selective Power Control as a national cable service? It does not require high initial penetrations as does utility meter reading and it certainly provides an incentive; that is, extra revenue for the system.

Washington, D.C.,[4] New York City,[5] Charleston[6] and San Jose[7] are experimenting with traffic control systems. Cable can provide the communication links for such services and save the city money.

The local distribution of specialized common carrier data may be another near-term service that cable can provide to its non-household customer.[8]

Cable systems should tap these non-household markets and include the entire city and its many functions as its clientele. Only in this way can cable be in a position to provide the broad spectrum of services promised. The economic arguments for multiple cables being drawn when the conventional plant is initially installed can be persuasive indeed.

Let me digress for a moment. When I moved into my home recently I found three built-in telephone outlets with seven twisted pairs behind each. Opportunities for twenty-one revenue producing services per household were being provided and I had not even spoken to the telephone company. There is a message there--for all of us.

COMMUNITY PARTICIPATION

Programming sources to supply this industry that continues to provide more and more channels can become a serious near-term problem. Local community studios, easily accessible and moderately equipped must be provided if a community voice (and a new program source) is to be realized. The FCC's[3] community access channel requirements and their additional requirement for one non-broadcast channel for each broadcast channel will insure programming the status of a long term issue.

Commissioner Johnson suggests[10] that portions of a relatively high franchise fee be reserved by cities through an independent commission or by private groups with grants from the city for the purpose of cablecasting programming. This idea sets up a middleman to handle the funds and decide on the type of programming. The handling fees of such collection commissions are well known.

The expense curves of Figures 2 and 3 include approximately one-fourth of the total yearly subscriber's fee being ploughed back yearly for programming purposes in both the one-way system configuration and in the two-way subscriber response system configuration. Over a ten year period this amounts to $15M being allocated to programming in the one-way system configuration and $34M in the two-way system configuration. In addition, it provides nine local studios moderately equipped costing a total of $500,000.

The economic analysis of an urban cable system requires many different assumptions and the sensitivity of these assumptions must be tested. For the Washington, D.C. system,[2] the economic analysis was repeated using various values for key parameters such as those shown in Table II.

SUMMARY

Again, these are just a few thoughts directed toward the peril side of cable's promise. They represent some changes in the conventional approaches directed toward obtaining the critical mass of subscribers necessary for both economic and social viability of urban cable systems.

ACKNOWLEDGEMENT

Many of the thoughts and much of the background information for this report were developed during the course of a study of the economic viability and technical feasibility of urban cable systems which was funded by The John and Mary R. Markle Foundation; Reference 2 is the final report of this study. I wish to acknowledge the contributions of other key members of the study team, Frank R. Eldridge, William F. Mason, Carol A. Paquette, Friend L. Skinner, and Ralph L. Smith.

TABLE II
SENSITIVITY ANALYSES

- RATE-OF-RETURN
  - D/E
  - INTEREST
  - MARKET VALUE
- SYSTEM PENETRATION
  - FINAL VALUE
  - GROWTH RATE
- CAPITAL COSTS
- SYSTEM MAINTENANCE
- ECONOMIES OF SCALE
  - STUDIO COSTS
  - PROGRAMMING COSTS
  - OPERATING COSTS
- MULTIPLE FRANCHISES

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